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ELECTRIC HAND-HELD POWER TOOL

Related Art

The present invention is directed to an electric hand-held power tool according to the
5 definition of the species in Claim 1.

With electric hand-held sanders in particular, such as eccentric or finishing sanders, cloth bags, paper bags or boxes are used to collect the sanding dust, and they are slid – using an outwardly-projecting inlet adapter - onto a dust-ejection adapter that encloses a dust-ejection opening in the machine housing. While paper bags are designed to be
10 disposable and to be thrown away with the collected dust, boxes have a dust collection chamber that, after the box is opened, can be emptied so the dust collection container can be reused. The inlet adapter leads into the dust collection chamber connected to an exhaust opening that has a dust filter located in front of it.

It has already been proposed to configure a dust collection container for an electric
15 hand-held sander as a box with a retracted, integrated inlet adapter and a dust collection chamber located above the inlet adapter. The dust collection chamber is closed with a removable cover that has an exhaust opening and a dust filter located in front of the exhaust opening. The inlet adapter is slid onto a dust-ejection adapter formed on the machine housing, thereby resulting in a dust collection container having a
20 compact design and short overall length that does not get in the way during operation of the hand-held sander and, to be emptied, can be easily removed from the dust-ejection adapter on the machine and then slid back on. To empty the dust-collection chamber, the cover with the attached dust filter must be removed.

25 Advantages of the Invention

The electric hand-held power tool with the features of Claim 1 has the advantage that, due to the fact that the dust-collection box is an integral component of the machine

housing, a separate housing is not required for the dust-collection container, thereby resulting in a considerable cost reduction in the manufacture of the electric hand-held power tool. In addition, improved and simplified handling of the machine is achieved, since the dust-collection container must no longer be separated – that is, detached or
5 pulled off - from the machine housing to be emptied. Instead, it is only necessary to remove the cover from the dust-collection box. Working times are shortened considerably as a result, in particular with electric hand-held power tools that generate a great deal of dust.

Due to the measures listed in the further claims, advantageous further developments
10 and improvements of the electric hand-held power tool described in Claim 1 are made possible.

Drawing

The present invention is described in greater detail in the description below with
15 reference to exemplary embodiments shown in the drawing.

Figure 1 is a side view of an eccentric sander with a dust-collection container shown in cross section,

Figures 2 through 4

20 are sectional views of the the same depiction as in Figure 1 according to three embodiments of the eccentric sander in Figure 1,

Figure 5 is a side view of an eccentric sander with integrated dust-collection container according to a second exemplary embodiment,

Figure 6 is a view of the eccentric sander in the direction of arrow VI in Figure 5,

25 Figure 7 is a side view of an eccentric sander with integrated dust-collection container according to a third exemplary embodiment,

Figure 8 is a view of the eccentric sander in the direction of arrow VII in Figure 7,

with the dust-collection container opened,

Figure 9 is a side view of an eccentric sander with integrated dust-collection container according to a fourth exemplary embodiment,

Figure 10 is a side view of an eccentric sander with integrated dust-collection container according to a fifth exemplary embodiment,

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Figure 11 is a perspective depiction of a dust filter located in the dust-collection container of the eccentric sander.

Detailed Description of the Exemplary Embodiments

10 The eccentric sander shown in a side view in Figure 1 as an exemplary embodiment of a general electric hand-held power tool has a machine housing 11, at least one dust-ejection opening 12 formed in machine housing 11, and a dust-collection container 13 connected to dust-ejection opening 12, a fan situated in machine housing 11 suctioning sanding dust from the surface of a machined work piece and blowing it into dust-collection container 13 via dust-ejection opening 12. The fan is driven by an electric drive motor that also drives sanding disc 14 located in front of machine housing 11. A possible design of the eccentric sander is shown in US 5 018 314, where it is described in detail.

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Dust-collection container 13 has a dust-collection box, referred to below as collection box 15, and a cover 16 that closes collection box 15. Cover 16 is provided with an exhaust opening 17 that has a dust filter 18 located in front of it. Dust filter 18 is attached to the inside of cover 16 and is removed when collection box 15 is opened by removing cover 16 from collection box 15. Collection box 15 is integrally joined with machine housing 11 and is designed as an injection-moulded part together with machine housing 11. In the exemplary embodiment in Figure 1, it has a cuboid shape with two open, diametrically opposed sides, the first open side facing machine housing 11 and covering dust-ejection opening 12, and the second open side being closed by cover 16. The two open sides are two of the longitudinal sides of collection box 15

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having the larger cross sections.

In the embodiments of dust-collection container 13 according to Figures 2, 3 and 4, collection box 15 also has a cuboid shape with two open sides, the first open side being one of the longitudinal sides of collection box 15 having the greater cross section and

5 the second open side being the upper (Figure 1) or lower (Figure 3) – as viewed in the working position of machine housing 11 – end face of collection box 15 having the smaller cross section. While the first open longitudinal side having the larger cross section of collection box 15 that is integrally joined with machine housing 11 faces machine housing 11 and covers dust-ejection opening 12, the second open end face of

10 collection 15 having the smaller cross section is covered by cover 16. With dust-collection container 13 according to Figures 2 and 3, cover 16 is also provided with exhaust opening 17, and dust filter 18 is attached to cover 16. In the exemplary embodiment in Figure 4, exhaust opening 17 is situated in the upper end wall of collection box 15 diametrically opposed to cover 16, and dust filter 18 is secured in dust

15 box 15. Cover 16 covers the lower – as seen in the working position of machine housing 11 – of the two end faces – which have the smaller cross sections – of cuboid collection box 15.

In the exemplary embodiment of the eccentric sander according to Figure 5 and 6, collection box 15 that is integrally joined with machine housing 11 is also configured as

20 a cuboid, but the diametrically opposed end faces with the smaller cross sections are open. The one open end face faces machine housing 11 and covers the dust-ejection opening there, while the other end face is covered by cover 16. Cover 16 is provided with exhaust opening 17, which is designed in the form of a screen 19. Although not shown, the dust filter is located in front of screen 19, the dust filter being designed as an

25 extrusion-coated pleated filter, for example, as shown in Figure 11. The dust filter can be attached to cover 16, so it can be removed along with cover 16 when it is removed. It can also be inserted as a separate component in collection box 15, so that, after cover 16 is removed, it must be removed separately from collection box 15 to be emptied.

With the eccentric sander with integrated dust-collection container 13 shown as an

30 exemplary embodiment in Figures 7 and 8, collection box 15 that is integrally joined with

machine housing 11 is designed as a cylinder that is open on the front. The one open front side faces machine housing 11 such that the dust-ejection opening provided in machine housing 11 is enclosed by collection box 15. A cap-like cover 16 is placed on the other open end face of collection box 15, which can be removed to empty the dust.

5 Dust filter 18, which is designed, e.g., as a pleated filter, is either inserted as a separate component in collection box 15 close to its end on the cover side and is secured such that it is axially fixed when cover 16 is attached, or it is attached to cover 16. Dust filter 18 is shown in Figure 7 in a top view after cover 16 has been removed. As a deviation from the previous exemplary embodiments with an exhaust opening, a plurality of

10 exhaust openings 17 in the form of holes can be provided in the wall of collection box 15.

With the eccentric sander shown in a side view in Figure 9, collection box 15 also has a cuboid shape with two open longitudinal sides oriented at a right angle relative to each other, i.e., they abut each other at a longitudinal edge of collection box 15. One of the

15 longitudinal sides having the larger cross section is integrally joined with machine housing 11, while the open longitudinal side having the larger cross section and being offset by 90° can be closed with cover 16. In Figure 9, dust-collection container 13 is shown with the cover removed. Dust filter 18, which can also be designed as a pleated filter according to Figure 11, for example, is inserted as a separate, removable

20 component.

In the exemplary embodiment of the eccentric sander according to Figure 10, a hollow handle 20 for guiding eccentric sander is integrally moulded with machine housing 11 as dust-collection container 13. The handle housing is collection box 15, which can be closed – by cover 16 – pn its open end facing away from machine housing 11. An air

25 duct is formed in machine housing 11 that travels away from the fan and leads into the dust-ejection opening of maching housing 11. The dust-ejection opening is enclosed by collection box 15 that is handle 20. The dust filter is also located on cover 16 in this case.

The various embodiments of dust-collection container 13 can also be used, of course,

30 as an integral component of machine 11 of a finishing sander or any other type of

electric hand-held power tool that produces sanding dust or saw dust.

With the exemplary embodiments shown, dust filter 18 is located in each of the dust-collection boxes 15. In the case of another advantageous exemplary embodiment, which is not shown, the dust-collection box can be located inside the dust filter instead.

- 5 Figure 11 shows an extrusion-coated pleated filter that is also substantially flat, as an exemplary embodiment of a dust filter 18. In another, not-shown exemplary embodiment, a pleated filter of this type is configured in the shape of a tube instead.